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Preferred perceptual learning styles of Chinese students

Alex Albert Pia
Portland State University

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APPROVED BY THE MEMBERS OF THE THESIS COMMITTEE:

[redacted]

Marjorie S. Terdal, Chair

[redacted]

Stephen A. Kosokoff

[redacted]

Thomas G. Dieterich

[redacted]

Nancy J. Benson

The basis for this study was work done by Joy Reid (1987) of Colorado State University. Reid's work analyzed the preferred perceptual learning styles of several groups of English as a Second Language students and one group of

American students. The learning styles concept has been established on the theory that students have a particular mode through which they learn best. The learning styles analyzed in this study were: auditory, visual, kinesthetic, tactile, individual, and group. The objectives of this study were to determine the relationships that exist between the preferred perceptual learning styles of P.R.C. and American students and such variables as country where student is studying, native language, length of time in the U.S., and sex.

A self-reporting questionnaire developed by Reid was used to determine the preferred perceptual learning styles of the following groups of students, which consisted of 30 students each:

1) Chinese students studying English in the People's Republic of China.
2) Chinese students from the People's Republic of China studying in the U.S.
3) American native English speaking students studying Chinese in the U.S.

The findings of this study indicated that a major learning style, as determined by the guidelines established by Reid, was not identified for any of the three groups of students analyzed. From the minor preferred perceptual styles identified for the three groups, a significant difference was found in the auditory style. Contrary to

previous studies and the hypothesis at the start of this study, the P.R.C. students were found to have a higher preference for the auditory style than the Americans. Also, the findings for this study suggest that the longer the P.R.C. students remained in the U.S., the less they preferred the auditory style.

Conclusions reached as a result of this study are that the learning style concept has problems in the areas of identifying style preferences for groups, distinguishing between major and minor learning styles, and maintaining a consistency of results.

PREFERRED PERCEPTUAL LEARNING STYLES OF CHINESE STUDENTS

by

ALEX PIA

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TO THE OFFICE OF GRADUATE STUDIES:

The members of the committee approve the thesis of Alex Albert Pia presented February 23, 1989.

[redacted]

Marjorie S. Terdal, Chair

[redacted]

Stephen A. Kosokoff

[redacted]

Thomas G. Dieterich

[redacted]

Nancy J. Benson

APPROVED:

[redacted]

James R. Nattinger, Head, Department of Applied Linguistics

[redacted]

Bernard Ross, Vice Provost for Graduate Studies

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The Lord is my strength and my shield;
my heart trusts in him,
and I am helped.

Psalm 28:7

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CHAPTER I

INTRODUCTION

> Man tries to make for himself
> in the fashion that suits him best,
> a simplified and intelligible
> picture of the world.
>
> Albert Einstein
> (Butler 1982 p. 61)

The idea that people vary in their approach in processing stimuli is not new, nor did it originate with Albert Einstein. And yet, with this idea as its basis, learning styles research is becoming an increasingly popular topic in the field of education. In fact, two in the educational field go so far as to say:

> One of the most promising movements in contemporary education is the attention being given to student learning styles.
> (Barbe and Milone 1981 p. 378)

Learning styles have been defined as "Cognitive, affective, and physiological traits that are relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe 1979:44). In other words, learning style represents each person's biologically and experientially induced characteristics which either foster or inhibit achievement (Dunn 1984:17). The term "preferred learning style" refers to a learner's

preference in perceiving, interacting with, and responding to the learning environment.

The learning styles to be examined in this study are perceptual learning styles, a term that describes the variations among learners in using one or more senses to understand, organize, and retain experience (Reid 1987 p. 89). These perceptual learning styles are seen in four forms:

(1) visual- the student learns best from seeing information in print;

(2) auditory- the student learns best by listening to information conveyed;

(3) kinesthetic- the student learns best by becoming physically involved in the learning experience;

(4) tactile- the student learns best by having the opportunity to do "hands on" experience with materials.

According to Gregorc (1979), learning styles are developed on what can be said to be a "nature/nurture" basis, meaning that factors such as genetic coding, personality development, and environmental adaptation are instrumental in the formation of the learning style of the individual. Although considerable research has been done in the area of learning styles and the American student, little research has been done with regards to identifying the preferred learning styles of non-native students. Joy

Reid's (1987) study, "The Learning Style Preferences of ESL Students," seems to be the first major work dealing with learning styles of the non-native student. Reid's study involved over thirteen hundred students from nine different language groups. Some conclusions reached by Reid as a result of her study are:

(1) Non-native students' learning style preferences often differed significantly from those of native students.

(2) Non-native students were apt to show a change in their learning style preferences when they had lived in the U.S. for a longer period of time.

(3) The learning style preferences of students with higher TOEFL scores closely resembled the learning style preferences of native speakers of English.

(4) There were gender differences in preferred perceptual learning styles, with male students preferring visual and tactile styles.

(5) The learning style preference means of non-native students who had lived in the U.S. the longest closely resembled the preference means of native speakers of English.

The above conclusions provided the basis for this study. The question is raised: Would these results from Reid's study regarding non-native students also apply to

students from China? The reason for this question stems from this writer's own desire to better understand the learning style preferences of Chinese students in order to be more effective in teaching these students. Also, it is hoped that the findings of this study will be of benefit to those wishing to spend time in China serving as English as a Second Language instructors.

OBJECTIVES

The objectives of this study were to determine the relationships that exist between the preferred learning styles of three groups of students and such variables as country where student is studying, length of time in the U.S., native language, and sex. The three groups studied were:

1) Chinese students studying English in the People's Republic of China (P.R.C.).
2) Chinese students from the People's Republic of China studying in the United States.
3) American native English speaking students studying Chinese in the United States.

After identifying the preferred learning styles of the aforementioned groups this study sought to answer the following questions:

1) Do preferred perceptual learning styles of Chinese students studying in the P.R.C. differ

significantly from those of P.R.C. students studying in the U.S.?

2) Do the preferred perceptual learning styles of P.R.C. students change for those students who have been in the U.S. more than 18 months? (This period of time has been arbitrarily chosen.)
3) Do the preferred perceptual learning styles of P.R.C. students in the U.S. more than 18 months closely resemble the preferred learning styles of American students?
4) Do differences exist between perceptual learning styles preferred by Chinese students studying English in the P.R.C. and American students studying Chinese in the U.S.?
5) Do Chinese male students prefer some learning styles significantly more than Chinese female students do?
6) Do American male students prefer some learning styles significantly more than American female students do?
7) Are there any differences between the preferred learning style of American and Chinese males?
8) Are there any differences in preferred perceptual learning styles between American and Chinese females?

The rationale for doing this study is based on the theory that the understanding of a student's learning style will help a teacher to be more versatile in meeting the learning needs of his or her students.

HYPOTHESES

In conclusion, if the results of this study match Reid's findings, then it will be seen that:

1) The preferred perceptual learning styles of Chinese students studying in the P.R.C. will differ significantly from those of P.R.C. students studying in the U.S.
2) There is a change in the preferred learning styles of Chinese students who have been in this country over 18 months.
3) The preferred learning styles of Chinese students in the U.S. over 18 months will closely resemble the preferred learning styles of American students.
4) The preferred learning styles of American and Chinese students differ significantly.
5) Chinese male students will prefer some learning styles significantly more than Chinese female students, and American male students will prefer some learning styles significantly more than

American female students. The preferred learning styles of American and Chinese males and American and Chinese females will be different.

The results of this study are intended to be of assistance to the ESL instructor by helping him or her to have a greater resource upon which to draw in seeking to meet the language learning needs of the Chinese student in the ESL classroom. Adapting one's teaching style or structuring one's lessons according to the preferred perceptual learning styles of one's students could help that instructor to be more effective in his or her teaching endeavors, according to current research.

CHAPTER II

REVIEW OF LITERATURE

BACKGROUND

The theory that individuals learn best through a particular learning style did not originate with a single individual, but it seems to have evolved as a result of findings from many whose studies showed that students demonstrated a particular preference in their approach to learning. An article written by John B. Carroll in 1963 served as the groundwork for further studies examining the behavior of teachers and learners in the classroom. Carroll's article, "A Model of School Learning," opposed a long-standing belief at that time -- that a learner's aptitude, as determined by I.Q., was the major factor in predicting achievement in a particular subject (cited in Henson and Borthwick 1984). In the model Carroll (1963) presented, aptitude was determined by the amount of time a learner would need to complete a particular learning task. He stated, "A Learner will succeed in learning a given task to the extent that he spends the amount of time that he needs to learn a task" (p.724). Carroll believed there

was a strong correlation between sufficient time allotted for learning a task and mastery of a learning task.

Supporters of the learning style approach point out that Carroll's view demonstrates confidence in the learners by not placing heavy limitations on them due to their I.Q. This is reflected in a statement by Henson and Borthwick concerning Carroll's study:

> Obviously, the implications of the previous study are staggering. They can be interpreted to mean that given the needed time and the correct teaching methods, almost any student can learn or master the material set before them (1984:4).

The above statement can be said to be a concise summary of the philosophy of the proponents of the learning styles approach because it emphasizes the potential of the individual learner when a compatible learning environment exists.

Also as early as 1963, Russell and Fea (in Gage 1963) concluded from their studies that children were visually, auditorially, and kinesthetically oriented with regard to ability in learning to read. Furthermore, they recommended that teachers use diagnostic devices to determine which avenue of learning is best for the individual child. Building on the work of Russell and Fea, Fischer and Fischer (1979) arrived at similar conclusions. They noticed that one child learned to spell by looking at a word carefully, shutting her eyes, and visualizing it. By contrast, another child wrote a word

at least eight times before learning how to spell it, while still another student had to spell a word aloud in order to learn it. Fischer and Fischer (1979) used these examples to support their assertions that students rely primarily on one sense for the meaningful formation of ideas.

Similar observations were made by Rubin (1975) who, in the course of studying strategies used by successful language learners, realized that some students were not comfortable unless they had something written in front of them, or unless they had the grammatical points under consideration in front of them. From her observations, Rubin concluded that some students learn better by visual means while others learn better by auditory means (49).

LEARNING STYLES

Significance

From initial observations such as these, which relate to perceptual learning styles, the concept of learning style analysis has emerged as an issue of increasing significance in the field of education. The International Reading Association showed its support for the learning style approach when it issued the following position statement: "Differences in the learning styles and abilities of children emphasize the need for a variety of approaches to meet those needs" (Carbo 1984: 72). A

major proponent of the learning styles theory is James Keefe, the National Association of Secondary School Principals' director of research, who wrote:

> Learning style diagnosis... gives the most powerful leverage yet available to educators to analyze, motivate, and assist students in school (Keefe 1979 p. 132).

Dunn (1984:17) points out some benefits that have resulted from the effort of teachers to implement the learning styles approach in the classroom:

1) increased academic achievement,
2) improved attitudes toward school,
3) reduced discipline problems.

For instance, Dunn (1984) found that students whose strengths were perceptual/kinesthetic rather than auditory/ visual did not learn well through either phonics or word recognition reading approaches. Such students achieved statistically better when taught tactually. Dunn concluded that "not only do people of all ages and intellectual capacities learn in ways that differ dramatically, but certain students achieve only through selected methods" (p.238).

Cavanaugh (1979) arrived at conclusions similar to Dunn's. Cavanaugh pointed out that because students are required to adjust their learning styles to whatever teaching approaches are used, their progress may be hindered. Cavanaugh reasons that for certain students

learning is made more difficult than it should be, causing frustration and decreasing a student's self-confidence.

Also in agreement with Dunn and Cavanaugh in realizing a connection between learning barriers and particular learning situations are Catheart, Strong and Fillmore (1979). They acknowledge that individual learners have different learning styles and state that, in their opinion, slow language learners are not deficient in their abilities to learn, but rather they exhibit characteristics which inhibit their learning in the particular situation in which they find themselves.

Identification

Before any reference to learning style characteristics can be made, it is necessary to understand how learning styles are identified. Friedman and Alley (1984) have counted over thirty different instruments which are used to identify preferred learning styles of students. These instruments range in form from self report inventories to direct observational checklists, with many instruments being a variation of the two.

Dunn (1984) determines the learning style preferences of students through a self report inventory called the "Learning Styles Inventory." This is a questionnaire which asks students to respond to statements about their learning. Concerning the question whether students are

capable of identifying their learning style, Dunn (1984) refers to the more than 350,000 students she has tested and states that most students are capable of knowing their preferred learning style. Dunn's conclusion is that when an element is important to a person, he or she is able to verbalize preferences and dislikes. However, when an element is unimportant, then a person cannot respond knowledgeably to questions about it (12).

An example of a direct observational instrument used to identify learning styles is cognitive mapping. This is an inventory used by observers to identify and describe particular features about a learner's preferred style. Components of this inventory are types of media, teaching style, and environmental factors.

The Edmonds Learning Style Identification Exercise (ELSIE) is another instrument used to identify preferred learning styles. ELSIE is based on the hypothesis that each individual learns most efficiently in certain ways and that one's pattern of internalization of their native language reflects the preferred learning style of the individual (Reinert 1976). ELSIE provides a profile of an individual's learning style through an analysis of the response of that person to a list of randomly selected words. The designers of ELSIE have concluded that a person's initial response after hearing a word on the test

will fall into one of four categories. That is, the person will either:

1) have a mental image of an object or activity,
2) have a mental image of the word spelled out,
3) receive meaning from the sound of the word without any visualization, or
4) have a fleeting kinesthetic reaction, either physical or emotional.

From the way the person responds, it can be determined whether that person's preferred learning style is visual, auditory, or kinesthetic.

Characteristics

The reason for so many learning styles instruments is that there are many characteristics within the general concept of learning styles. Yet with regard to defining all the characteristics that make up the concept of learning styles, the data are inconclusive. Keefe (1979) broadly defines learning styles as encompassing three dimensions -- cognitive, affective, and physiological:

1. Cognitive style is defined as "information processing habits representing the learner's typical mode of perceiving, thinking, problem solving, and remembering" (8). Cognitive Style explains how information is processed. Doyle (1984) has identified twenty types of cognitive style alone.

2. Affective style is defined as "those dimensions of personality that have to do with attention, emotion, and valuing," (11). Stated in another way, affective style is the result of motivational processes that reflect how a learner arouses, directs and sustains particular behaviors while involved in a learning situation. Some elements of this style include high versus low persistence, competition versus cooperation, and risk taking versus caution.
3. Physiological style is defined as "biologically based modes of responses that are founded on sex related differences, personal nutrition and health, and accustomed reaction to physical environment" (15). This style identifies customary functioning traits arising from a student's physical state. Some elements of this style are masculine/feminine, time rhythms, and need for mobility.

Gregorc (1984) adds another aspect to the concept of learning styles as a result of his study of over 400 high school age and adult subjects. He concludes that "style characteristics are related to systems of thought and the driving forces of the mind" (p.53). Thies' (1979) research on the brain supports Gregorc's conclusions. Thies states that the temporal, parietal, and occipital lobes of the brain each act as a center for a particular perceptual process: the temporal lobe is the seat of the

auditory processes; the parietal lobe, the tactile and kinesthetic processes; and the occipital lobe, the visual processes.

Another approach researchers use to grapple with the concept of learning styles is to explain what a learning style is not. Keefe (1979) explains that a learning style is not the same as an ability. He states that an ability has to with content of cognition, the "what" of the information processing act. Also, ability is measured according to a value -- more of an ability is better than less of an ability. However, learning styles illustrate the "how" of the cognition process. Styles deal with manner or preference. They are seen as having an adaptive value in differing circumstances.

Schmeck (1979) adds an interesting perspective to the task of defining learning styles by stating the difference between a learning style and a common learning strategy:

> A learning strategy is that pattern of information processing activities that a person engages in when confronted by a learning task. If a person demonstrates a predisposition to favor a particular strategy, then he or she is manifesting a learning style. Thus a style is simply a strategy one uses with some cross situational consistency (p.73).

As the above descriptions of learning styles reflect, there are many who offer possibilities, but none who have the final word on the matter. And it is exactly with this point that many resist the learning styles

concept. Hyman and Rosoff (1984: 36) speak of the lack of clarity involved in the definition of learning styles. They point out that many definitions of learning styles focus on certain elements that affect a person's ability to absorb and retain information, but the behavior of a person is not addressed. In contrast, Hyman and Rosoff point to definitions of the concept of teaching styles. They point out that these definitions often do not refer to what a teacher is, but rather how the teacher interacts with students when teaching. In other words, observable actions, not characteristics of being, are the focus. Therefore, because of the ambiguity that surrounds this loosely defined term, many do not support the learning styles concept.

TEACHING STYLES

Just as individual students have preferred learning styles, so teachers have preferred teaching styles. It is commonly believed that teachers teach in the way they were taught, but Dunn and Dunn conclude: "Teachers teach the way they learned" (1979: 241). Research supports the idea that teachers are very likely to use a teaching style which stems from their preferred learning style. Implications from studies by Friedman (1984) and Dunn and Dunn (1979) point out that many teachers have a subconscious assumption that the way they learn best is

the most effective way for everyone to learn. Dunn and Dunn (1979: 241) point out that many instructors believe that the way they learned is the "easy" or "right" way, and as a result, the best way for others to learn as well. Barbe (1981: 379) cautions teachers that their intuitive ideas about what is the best way for others to learn can be misleading, and she exhorts supervisors to proceed with caution in evaluating the effectiveness of teachers whose style differ from their own. Friedman (1984) warns that teachers need to guard against teaching exclusively in their own preferred learning style. Students whose preferred learning style differs from that of the teacher should be taken into consideration when lesson plans are being formed or evaluated. For example, it has been estimated that 90% of all instruction occurs through the "lecture" and/or "question and answer methods," yet only between two or three students in each group of ten learn best by listening (Dunn et al. 1979:49).

MATCHING LEARNING STYLES AND TEACHING STYLES

Results from a recent study by Bassano (1986) on the topic of emotional distress in the ESL classroom have implications for the topic of matching teaching and learning styles. Of the 72 adult ESL students tested, 32% rated themselves as unhappy with their classes in the U.S. The data supported the researcher's hypothesis that those

students who experienced the most anxiety, confusion, distress and frustration were also those students whose expectations and objectives differed the greatest from those of the instructors. In other words, Bassano found that one of the primary causes of student emotional distress in the ESL classroom was the unfamiliar instructional practice encountered by foreign students in the U.S.

Proponents of the learning style approach in the classroom have been saying all along what Bassano recently discovered -- that a matching of learning and teaching styles leads to more effective learning while a disparity of learning and teaching styles leads to less effective learning. Hansen and Stanfield (1982) found that when students and teachers were matched for degree of field dependence/independence, they liked each other better and felt a greater interpersonal attraction than when they were mismatched in their styles.

Studies conducted at St. John's University (Carbo (1980), Cafferty (1980), Copenhaver (1979) and Farr (1971)) all had similar results: the greater the match between students' and teachers' style, the higher the grade point average; significantly more positive attitudes resulted when students' styles were similar to their teachers; individuals accurately predicted the modality in which they would achieve superior academic performance; it

was advantageous to learn and to be tested in the preferred modality.

Furthermore, Hansen and Stanfield (1982) found in their study of field dependent/independent learners studying a foreign language that when students and teachers matched for degree in field dependence/ independence, they liked each other better and felt a greater interpersonal attraction than when they were mismatched -- although test scores did not seem to be affected. Seen from one perspective, the issue appears very clear -- there is a great advantage to matching teaching styles with learning styles. However, as in most cases, there is another side to the issue. In an article entitled, "Dynamic Disequilibrium: The Intelligence of Growth," Joyce (1984) presents the argument that if there is not a certain tension surrounding the student, optimal learning will not take place. Commenting on research done by Hunt, Joyce states:

> If the environment is perfectly matched to the development level of the learners they are likely to be arrested at that level... If the environment is too comfortable or "reliable" the learners may be satisfied at the stage of concrete thinking where the ability to integrate new information and form new conceptual patterns is limited indeed. To impel learners to diverge from the familiar sets of concepts that enable them to view the world in "blacks and whites," the environment must be dissatisfying in some ways...discomfort is a precursor to growth. To stimulate development, we deliberately mismatch student and environment so that the student cannot easily maintain the familiar patterns but move on toward greater complexity. (But not too much so, for we seek an optimal mismatch where the learners'

> conceptual systems are challenged, but not overwhelmed) (p. 27).

To further weaken the argument that there is an advantage to matching teaching and learning styles, some replications of studies where significant gains were reported as a result of matching teaching and learning styles did not show similar results. Corbett (1984) tested students who were shown to have a preference for auditory learning according to the learning styles test, ELSIE. Corbett found that these students did not excel in classes where listening was the primary focus in the class.

Finally, there is the question of value or significance to matching styles. Doyle (1984) gives little support for matching styles, pointing out that learning and teaching are complex tasks, and that style is only a minor aspect of the entire process. Therefore, there is no reason to expect a significant increase in achievement simply by matching styles.

LEARNING STYLES AND CHINESE STUDENTS

Bassano's (1986) study of emotional distress in the ESL classroom showed that a significant number of ESL students found themselves unhappy with their classes in the United States. When the negative responses were analyzed according to language groups the highest

percentage of dissatisfied students were Asian (p. 17). Since Bassano found that the most frustrated students were the ones who experienced the greatest difference between their expectations and objectives for the class and those of the instructor, it is important to look into some possible reasons for these differences of approach.

Wu (1982) offers some insight into this problem by pointing out that a Chinese student is more inclined to process visual material due to the nature of Chinese writing. Chinese writing is a code of visual labels and ideas, while English writing is a code of sounds. For example, the Chinese character for "speech" does not give the sound but the concept of "speech." In contrast, the word "speech" in English is conveyed first in sound and then in concept. For this reason, Wu (1982) explains:

> The user of the Chinese code is more used to giving priority to the visual channel of transmission, and would not feel very much at home in a learning environment in which only listening and speaking are emphasized, as in the initial stages of ESL (p.121).

A study by Turnage and McGinnies (1972) agrees with Wu's view that Chinese students tend to be visual in their learning style preference. The study tested the most effective mode of stimulus presentation (visual or auditory) for Chinese and American students. These two groups of students were tested for their performance on a short term serial recall test. Students either saw or listened to 15 words which were presented in random order

at one second intervals. The students then opened a booklet which contained the same words written in alphabetical order and indicated the serial order they had just seen or heard the words.

The results of the study showed that the Chinese students learned significantly more through the visual mode, while the American students learned more through the auditory mode. The results of this study confirmed Turnage and McGinnie's hypothesis that different learning rates for the students of the two language groups would occur with different modes of stimulus presentation. And it may be because of this that some Chinese students are experiencing frustration in the American classroom -- they are visual learners in a class where the instruction is aimed primarily at auditory learners.

Further cultural explanation as to reasons why Chinese students tend to have a visual preferred learning style is supplied by Wu (1982). He points out the preference for the visual by the Chinese stems back to the time when there was an attempt to unite China through a common written language because of the existence of many dialects among the Chinese people. The individual was expected to learn the written code so as to be a member of the common society. Consequently, the respect attributed to the written form was immense, to the extent that pieces of paper with writing on would not be discarded. Even to

this day, the saying, "Ching-hsi tzu chih, kung-teh wu liang" (to respectfully save writing and paper would accumulate unlimited merit) is common. Wu cites this viewpoint as being responsible for the great respect for books as authority in Chinese society. However, many who have observed the Chinese educational system will point out that Chinese instructors teach predominantly through the lecture mode. Neither Wu nor Turnage and McGinnies address this point.

CONCLUSION

At this stage in the development of the learning styles concept, much of the information is in need of further analysis because of the lack of general agreement as to the implications of many of the studies that have been conducted in this area. However, certain findings have been well supported and worthy of full acceptance. The theory that students vary in their approach to learning and seem to prefer one modality above another has been supported by studies over a number of years and from a variety of fields. This theory relates to the current study in that Chinese students are reported to have a visual preference in their approach to learning.

There is also strong support for the theory that a variety of teaching approaches are needed to meet the needs of learners with various preferred learning styles.

Many would call for a matching of teaching and learning styles in order to most effectively utilize the knowledge of students' learning styles. In light of opposing evidence, it is difficult to determine the actual benefit that can be derived by allowing a learner to be taught exclusively through his or her preferred learning style. However, with the proper perspective, the knowledge of students' learning styles can be said to have a rightful place in the classroom. Hyman and Rosoff (1984) offer six recommendations which serve as a guideline in using the learning styles approach in the classroom.

1) The teacher should not focus on learning style as the sole or even main element which influences the teacher's actions.
2) The teacher should not view scores on learning styles preference or description tests as being final or unchangeable.
3) The teacher should conceive of learning styles as referring to actions of the student rather than ability of the student when evaluating students for personal characteristics such as learning style.
4) The teacher should accept a concept of learning style which is broader than cognitive achievement as determined by a numerical score on a paper and pencil test.

5) The teacher should recognize and attend to the only actions which the teacher can control -- his or her own.

6) The teacher should avoid using learning styles from a unilateral approach -- that is, the teacher administers the learning styles test, finds the best results, prescribes the current teaching style for the "patient" and renders a prognosis for the parents and school officials.

CHAPTER III

METHOD

SUBJECTS

The survey results of a total of 90 students were analyzed in order to determine the preferred learning styles of three groups of students. These groups were comprised of:

1) 30 Chinese university students studying English in the People's Republic of China.
2) 30 Chinese university students from the People's Republic of China studying various subjects at Portland State University.
3) 30 native English speaking American students studying Chinese at Portland State University.

These three groups were determined on the basis that they were all involved in language study. The choice that the American group would consist of people studying the Chinese language was deliberately made with the hope that China bound ESL/EFL teachers with a background in learning Chinese would more closely identify with the findings. The American students were randomly selected from names of native English speakers listed on four different

enrollment lists for Chinese courses conducted at Portland State. Two of the courses were first year courses; one was a second year course; and another was a third year course. Of the 30 students selected, 17 were male, and 13 were female. This group ranged in age from 17 years to 35 years, with the average age being 23 years.

All the students whose surveys were analyzed were randomly selected with exception to one group -- the Chinese students at Portland State. An initial attempt at randomly selecting students from a list of P.R.C. students attending Portland State proved to be futile due to the mobility of these students. Therefore, the 30 surveys used in this study were obtained through chance encounters with P.R.C. students on the Portland State campus. There were 10 female and 20 male students in this group, averaging in age from 25 to 49 years, with the average age being 30 years.

In obtaining surveys from the P.R.C., three English teachers (two American and one Chinese) at universities in Beijing, Wuhan, and Changsha were asked to give the learning styles survey to their students. From the 120 surveys returned, 10 surveys from each university were randomly selected. This group, consisting of 13 female and 17 male students, ranged in age from 17 to 35 years, with the average age being 23 years.

MATERIALS AND PROCEDURES

A self reporting questionnaire developed by Joy Reid (1987) of Colorado State University was used to determine the preferred learning styles of the three aforementioned groups of students (Appendix A). In her study, Reid used the questionnaire to determine the learning style preferences of 1,234 English As A Second Language students who were categorized into eight different language groups. Although the Chinese were one of the language groups surveyed, the results in Reid's study may be misleading because Chinese students from several countries were a part of the group (98). For a more detailed observation, this study focused solely on Chinese students from the P.R.C. In addition to the ESL students, Reid also surveyed a group of 154 native speakers of English for her study. Reid has given her consent for her survey to be used in this study (Appendix B).

In constructing her survey, Reid used existing learning style instruments along with suggestions made by non-native student informants and U.S. consultants in the fields of linguistics, education, and cross-cultural studies. The survey was constructed especially for non-native students. Validation of the questionnaire was done by the split-half method, and correlation analysis of an original set of 60 statements determined which 30

statements would be used in the questionnaire. The 30 statements were presented in sentences such as, "I learn more when I make a model of something." The student was then asked to mark one of five choices ranging from "strongly agree" to "strongly disagree." The survey was made up of sets of five randomly arranged statements which corresponded to one of the six learning styles.

The attitude rating scale used in this survey was a five-point agreement scale, which had a range of five points for the answer of "strongly agree" and one point for the answer of "strongly disagree." Total points were compiled for each category of learning styles, and the mean scores of that total were used to classify a learning style for a particular group as either major, minor, or negligible, according to each set of variables. Reid determined that mean scores falling between 38 and 50 would be considered major leaning style preferences, while scores of 25 to 37 would signify minor learning styles, and scores below 25 would be classified as negligible learning styles (Appendix C).

The questionnaire began by asking some personal information of the student such as name, age, gender, and length of time in the U.S. The directions on the survey explained that people learn in different ways, and that the purpose of the questionnaire was to identify the way that students preferred to learn. An example of a

particular learning style preference was then cited. Finally, the student was asked to respond to the statements that followed as they applied to the student's language study, and an example was given to demonstrate how to mark the attitude rating scale. For the overseas teachers, an explanation of some of the terms in the questionnaire was provided (Appendix D), and the teachers were informed that they could answer questions from the students regarding any of the terms.

CHAPTER IV

RESULTS

The objectives of this study were, first, to identify the preferred learning styles of P.R.C. students in China, P.R.C. students in the U.S., and American students, and second, to analyze the styles for significant differences among the student groups and subgroups. To reach these objectives, raw data (Appendix E) from the self-reporting surveys were statistically analyzed. The expectation for this study was that the results would support the conclusions found in Reid's study, and to a degree, some of the results did support Reid's study; however, it was not in ways as might have been anticipated.

OVERVIEW OF PREFERRED STYLES

To identify the preferred learning style of a group, a mean score was established for each of the six learning styles. An overview of the combined scores of the three groups showed mean scores between 35.378 and 36.578 for five of the six styles even though individual scores within the groups differed by as much as 30 points. The

only exception was the group style, which had a mean score of 29.2 (Table I).

TABLE I

COMBINED SCORES OF THE THREE GROUPS SURVEYED

	V	A	K	T	G	I
Min.	20.000	18.000	22.000	20.000	14.000	20.000
Max.	50.000	48.000	48.000	50.000	44.000	50.000
Mean	35.578	35.378	36.222	36.578	29.200	35.667
St. D.	5.902	5.216	5.274	5.900	6.667	6.536

N of cases = 90
V = visual
A = auditory
K = kinesthetic
T = tactile
G = group
I = individual

According to the standards established by Reid, the mean scores are to be interpreted as follows:

Major learning style 38 - 50

Minor learning style 25 - 37

Negative learning style 0 - 24

Based on these guidelines, all of the styles analyzed (with the possible exception of tactile for Chinese in U.S. with a mean score of 37.866) can only be considered as minor learning styles for the three aforementioned groups (Table II). However, when subgroups were formed, some major learning styles emerged.

TABLE II

MEAN SCORES FOR THE PREFERRED LEARNING STYLES FOR THE P.R.C., PRC IN THE U.S., AND AMERICAN GROUPS

	V	A	K	T	G	I
P.R.C./ China:	36.600	36.400	37.267	36.533	29.667	36.733
P.R.C./ U.S.:	36.666	36.860	35.266	37.866	30.133	35.200
Amer./ U.S.:	34.467	33.200	36.133	35.333	28.433	35.067

To test for significant differences of learning styles between the three groups, an analysis of variance (ANOVA) was used. The research design of this study required a one way ANOVA, which is used when there is one dependent variable and one independent variable with two or more levels. Comparisons of the three student groups selected for this study indicated a significant difference, $P = .018$ ($P < 0.05$), occurring in the auditory style (Table III).

TABLE III

ONE WAY ANOVA FOR THE P.R.C., AMERICAN, AND P.R.C. IN U.S. GROUPS

VISUAL N=90

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	64.622	2	32.311	0.926	0.400
error	3035.333	87	34.889		

AUDITORY N=90

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	213.689	2	106.844	4.211	0.018*
error	2207.467	87	25.373		

KINESTHETIC N=90

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	60.357	2	30.178	1.087	0.342
error	2415.200	87	27.761		

TACTILE N=90

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	96.356	2	48.178	1.396	0.53
error	3001.600	87	34.501		

GROUP N=90

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	26.867	2	13.433	0.293	0.747
error	3989.533	87	45.857		

INDIVIDUAL N=90

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	51.467	2	25.733	0.597	0.553
error	3750.533	87	43.110		

* = significant

ANALYSIS OF DIFFERENCES BETWEEN GROUPS

To answer the specific question related to differences in preferred learning styles among the various groups and subgroups analyzed in this study, a T-Test for Independent samples was used. A T-Test is a statistical test for the comparison of two means. Independent samples exist when scores belong to different persons.

Differences in styles between P.R.C. Chinese students in the P.R.C. and in the U.S.

The purpose in analyzing these two groups was to determine if a difference in educational systems would also result in a difference in preference of learning styles. No significant differences were found between these two groups (Table IV).

TABLE IV

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN P.R.C. AND THE CHINESE IN THE U.S. GROUP MEAN SCORES

	V	A	K	T	G	I
P.R.C. mean:	34.600	36.400	37.267	36.533	29.667	36.733
U.S. mean:	36.666	36.860	35.266	37.866	30.133	35.200
DF:	58	58	58	58	58	58
T St:	-1.496	-0.398	1.505	-0.935	-0.297	-0.912
P <.05:	0.140	0.345	0.068	0.176	0.383	0.365

P.R.C. students in the U.S. less than 18 months and more than 18 months

The purpose in analyzing these two groups was to notice if a change occurred in the learning styles of Chinese students who lived in the U.S. for a longer period of time. The groups consisted of 17 students for those under 18 months and 13 students for those over 18 months. No significant differences were found between these two groups (Table 5).

TABLE V

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF P.R.C. STUDENTS IN THE U.S. LESS THAN 18 MONTHS AND MORE THAN 18 MONTHS

	V	A	K	T	G	I
Less mean:	36.235	37.176	36.000	38.353	29.059	35.765
More mean:	37.231	35.692	34.308	37.231	30.077	34.462
DF:	28	28	28	28	28	28
T St:	0.487	1.251	0.831	0.637	-.390	0.473
P <.05:	0.314	0.110	0.206	0.264	0.700	0.319

American students, P.R.C. Students in the U.S. less than 18 months, and P.R.C. students in the U.S. more than 18 months

In this case, these groups were analyzed to determine whether there is a greater similarity in learning styles between American students and P.R.C. students in the U.S. over 18 months than between American students and P.R.C.

students in the U.S. less than 18 months. Two types of tests were used: ANOVA and T-Tests. The ANOVA showed a significant difference, P = .045 (P < 0.05), existing among the groups in the auditory style (Table VI).

TABLE VI

ANOVA FOR AMERICAN STUDENTS AND P.R.C. STUDENTS LESS THAN AND MORE THAN 18 MONTHS

VISUAL N=60

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	28.900	2	14.450	0.369	0.693
error	2234.833	57	38.208		

AUDITORY N=60

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	182.894	2	91.447	3.266	0.045*
error	1596.040	57	28.001		

KINESTHETIC N=60

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	32.364	2	16.182	0.532	0.590
error	1734.236	57	30.425		

TACTILE N=60

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	105.543	2	52.772	1.606	0.210
error	1872.857	57	32.857		

GROUP N=60

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	24.702	2	12.351	0.225	0.799
error	3133.231	57	54.969		

INDIVIDUAL N=60

Source	Sum-of-Square	DF	Mean Square	F-Ratio	P
students	12.777	2	6.389	0.128	0.880
error	2854.156	57	50.073		

American students and P.R.C. students in the U.S. more than 18 months

Similar to the ANOVA results, T-Tests also showed a significant difference ($P < 0.05$) between the American students and the P.R.C. students in the U.S. in auditory style. However, this difference was found only between the American students and the P.R.C. students in the U.S. less than 18 months, $P = .018$ (Tables VII and VIII). Also, in the less than 18 month subgroup, tactile is identified as a major learning style with a mean score of 38.353. However, it does not differ significantly from the minor learning style of the American students who had a mean score of 35.333 which resulted in $P = .097$.

TABLE VII

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF AMERICAN STUDENTS AND P.R.C. STUDENTS IN THE U.S. MORE THAN 18 MONTHS

	V	A	K	T	G	I
Americans Mean :	35.467	33.200	36.133	35.333	28.433	35.067
P.R.C. in U.S. >18mo Mean:	37.231	35.692	34.308	37.231	30.077	34.462
D.F.:	41	41	41	41	41	41
T Stat:	-0.767	-1.272	1.013	-0.926	-1.238	-.276
P<.05 :	0.223	0.105	0.158	0.179	0.111	.748

TABLE VIII

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF AMERICAN STUDENTS AND P.R.C. STUDENTS IN THE U.S. LESS THAN 18 MONTHS

	V	A	K	T	G	I
P.R.C. in U.S. <18 mo :	36.235	37.176	36.000	38.353	29.058	35.765
Americans:	35.467	33.2	36.133	35.333	28.433	35.067
D.F. :	45	45	45	45	45	45
T Stat :	.419	2.466	-.079	1.696	.284	.318
P<.05 :	.678	.018*	.938	.097	.777	.752

American students and P.R.C. students

The purpose in analyzing these two groups was to determine whether any significant differences in preferred learning styles existed between American students and P.R.C. students studying in their own country. The results showed a significant difference, $P = .026$ ($P < 0.05$), in the auditory style between these two groups of students (Table IX).

TABLE IX

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF AMERICAN STUDENTS AND P.R.C. STUDENTS

	V	A	K	T	G	I
Americans Mean :	35.467	33.200	36.133	35.333	28.433	35.067
PRC Mean :	34.600	36.400	37.267	36.533	29.667	36.733
D.F. :	58	58	58	58	58	58
T Stat :	0.548	-2.292	00.852	-0.729	-0.716	-1.053
P<.05) :	0.292	.026*	.198	0.234	0.238	0.297

Chinese male and Chinese female students

An analysis of learning styles between male and female Chinese students showed significant differences of P = .024 and P = .028 (P < 0.05) respectively in the Kinesthetic and individual styles. In the case of the females, their kinesthetic style was found to be a major learning style which differed significantly, P = .024, from the minor learning style of the men. In the case of the males, their individual learning style was almost considered a major learning style (37.405) and was found to differ significantly from the individual style of the females.

TABLE X

TWO SAMPLE T-TEST FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF P.R.C. MALE AND P.R.C. FEMALE STUDENTS

	V	A	K	T	G	I
Male:mean:	35.676	36.973	35.081	36.757	29.189	37.405
Fem: mean:	35.565	35.652	38.174	37.913	30.217	33.652
D.F. :	58	58	58	58	58	58
T Stat :	.076	1.152	-2.322	-.787	0.622	2.248
P<.05 :	.434	.254	.024*	.434	.536	.028*

American male and American female students

Between American male and female students, the male students favored group learning significantly, P = .001, above females.

TABLE XI

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF AMERICAN MALE AND FEMALE STUDENTS

	V	A	K	T	G	I
Male:mean:	34.615	34.923	36.6162	36.462	32.923	32.615
Fem: mean:	36.118	31.882	35.882	34.471	25.000	36.941
D.F. :	28	28	28	28	28	28
T Stat :	-0.585	1.358	0.280	0.823	3.199	-1.827
P<.05) :	0.281	0.092	0.390	0.208	.001*	0.078

Chinese male and American male students

The only difference found between the males in this study was in the individual style, where the Chinese males reflected a significantly, P = .036, higher preference than the American males.

TABLE XII

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF CHINESE MALE AND AMERICAN MALE STUDENTS

	V	A	K	T	G	I
Chinese Mean:	35.676	36.973	35.081	36.757	29.189	37.405
American Mean :	34.615	34.923	36.462	36.462	32.923	32.615
D.F. :	48	48	48	48	48	48
T Stat :	.546	1.315	-.827	.153	-1.717	2.162
P<.05:	.588	.195	.412	.879	.092	.036*

Chinese female and American female students

Between the females in this study, two differences were recorded. The first difference was found in the auditory style, with the Chinese females being significantly higher, P = .027. The second difference was found in the group style, with the Chinese females again being significantly higher, P = .009.

TABLE XIII

TWO SAMPLE T-TESTS FOR THE DIFFERENCE BETWEEN GROUP MEAN SCORES OF CHINESE FEMALE AND AMERICAN FEMALE STUDENTS

	V	A	K	T	G	I
Chinese mean :	35.565	35.652	38.174	37.913	30.217	33.652
American mean :	36.118	31.882	35.882	34.471	25.000	36.941
D.F. :	38	38	38	38	38	38
T Stat :	-.291	2.306	1.362	1..860	2.759	-1.844
P<.05 :	.733	.027*	.181	.071	.009*	.073

These results show a few constants. The major consistent result was in the significant difference between the American students and the P.R.C. students in the auditory style. This difference was found not only in these two groups but also when these groups were divided into subgroups such as American females and P.R.C. females and American students and P.R.C. students in the U.S. less than 18 months.

Another consistent result was found in the Chinese males' preference for the individual style. Their preference for the individual style was significantly above both the Chinese females and the American males.

Finally, the American females showed significantly less favor for group learning than two other groups: American males and Chinese females.

CHAPTER V

DISCUSSION AND IMPLICATIONS

SUMMARY

This final chapter consists of two sections. The first part addresses each of the questions stated as objectives for this study. Following each of the questions there is an explanation of Reid's findings, followed by a discussion on the findings of this study. The second part is a conclusion suggesting some implications from this study.

To begin with, this study attempted to identify the preferred learning styles of three groups of students:

1) Chinese students studying English in the P.R.C.
2) Chinese students from the P.R.C. studying in the U.S.
3) American native English speaking students studying Chinese in the U.S.

Reid found that the Chinese students in her study had four major learning style preferences. In order of highest preference, the styles were: kinesthetic, tactile, auditory, and visual. The American students had two major learning style preferences: first, auditory and second,

kinesthetic. Of the nine language groups that Reid analyzed, three of the groups had identified multiple major learning style preferences, consisting of four styles for each group. If fact, every group with the exception of one (Japanese) had at least two major learning style preferences.

However, when the three student groups in this study were analyzed according to the same guidelines used by Reid, none of the groups had even one style which could be identified as either a major learning style or a negative learning style. An observation of the raw data (Appendix D) shows that within each of the three groups individuals had scores reflecting major learning styles; however, the scores were so diverse that none of the styles emerged as a major preferred style when the scores of the entire group were combined. In addition, an ANOVA test for the three groups showed a significant difference only in the auditory style.

One explanation that might account for this disparity of scores is the uniqueness of the groups involved in this study. Possibly, these groups contain an unusual group of individualists due to the nature of the groups: Chinese students in education and medical programs in colleges in China, Chinese students selected as some of the privileged few to be able to study abroad, and American students studying Chinese at an American university. However, Reid (1987) suggested that great differences within a group (e.g.

multiple cultures) leads to multiple major learning style preferences for that group (p.98); whereas, in this study it is suggested that great individual differences within a group lead to an absence of major learning styles for a group.

A further cause for the results of this study could be due to the instrument used. The instrument may have some problems with validity and reliablity, and that may be the reason why this study differed in some ways from Reid's study. Also, it is possible that the students may not have self reported accurately. It is questionable how well the P.R.C. students were able to relate to terms like "role play" and "make a model" since most of the students probably had very little experience learning through these channels.

Another reason for the lack of identifiable major learning style preferences found in this study might be due to the size of the groups used in this study. Possibly a larger group would have shown more distinct style preferences. However, in many cases the opposite is true -- smaller groups show more distinction than the larger groups due to the leveling that occurs when a large number of scores are combined. This is true of the results from this study. The smaller groups tended to show a major learning style preference more easily than the larger groups.

As a result of not being able to identify major preferred learning styles for each of the three groups, the

first three research questions were answered without a distinction of major or minor learning styles being made.

Question 1 asked:

> Do the preferred perceptual learning styles of Chinese students studying in the P.R.C. differ significantly from those of P.R.C. students studying in the U.S.?

The data indicate a negative answer. This question was based on Reid's conclusion that students were apt to show a change in their learning style preferences when they lived in the U.S. for a longer period of time. However, the findings of this study show no significant differences between these two groups of students.

Question 2 asked:

> Do the preferred perceptual learning styles of P.R.C. students change for those students who have been in the U.S. more than 18 months?

Again the answer is negative. This question was based on Reid's conclusion that the longer students lived in the U.S., the more auditory their preference became. However, in this case, the purpose was to determine whether any changes occurred within a group when the group was divided according to students who had been in the U.S. for a shorter period of time and students who had been in the U.S. for a

longer period of time. The selection of 18 months as being the dividing line was an arbitrary decision made before any data were collected.

Statistical analysis of these two Chinese subgroups showed that there was no significant difference in the learning style preferences between the group of P.R.C. students in the U.S. less than 18 months and those in the U.S. more than 18 months. With regard to the conclusion made by Reid concerning the increased auditory style preference of students who lived in the U.S. for a longer period of time, an examination of the auditory style mean for these two groups of students showed the P.R.C. students in the U.S. less than 18 months to have a higher mean score. This suggests that the longer these students were in the U.S., the less they preferred the auditory style.

Question 3 asked:

> Is there a greater similarity in perceptual learning styles between P.R.C. students in the U.S. more than 18 months and American students than between P.R.C. students in the U.S. less than 18 months and American students?

The answer here is positive. This question is based on a conclusion reached by Reid, who found that the learning style preference means of non-native students who had lived in the U.S. the longest closely resembled the preference

means of native speakers of English. To answer this question, two types of statistical tests were conducted: one way ANOVA and T-Tests. The ANOVA test was conducted with three groups of students: P.R.C. students in the U.S. less than 18 months, P.R.C. students in the U.S. more than 18 months, and American students. The results showed a significant difference, $P<.05$, between the groups in the auditory style.

Further examination using a T-Test to analyze the difference in styles between the P.R.C. students in the U.S. under 18 months and the American students also showed a significant difference, $P<.05$, occurring in the auditory style. However, when a T-Test was used to analyze the difference between the P.R.C. students in the U.S. more than 18 months and the American students, no significant difference was found. This is quite interesting because in Reid's study she equated becoming more auditory with becoming more similar to Americans in style preference.

These results show support for Reid's conclusion that the learning style preferences of non-native students who had lived in the U.S. the longest closely resemble the preference means of native speakers of English. However, the support for Reid's conclusion comes in a reverse manner, for in these results the P.R.C. group in the U.S. over 18 months shows its similarity to the American group by becoming less auditory.

Question 4 asked:

> Do differences in perceptual learning styles exist between P.R.C. students and American students studying Chinese in the U.S.?

The answer here is yes. This question was based on Reid's conclusion that non-native learning style preferences often differ significantly from those of native students. The statistics showed that the P.R.C. students considered themselves significantly, $P<.05$, more auditory than the American students. This result supported Reid's conclusion as well as added additional support to a consistency occurring in this study: American students and P.R.C. students have their greatest learning style difference in the auditory style. When compared to the findings of Reid, Wu (1982), and Turnage and McGinnies (1972), this result appears to be most interesting. One problem, however, is that the auditory style was not found to be a major learning style for either of these groups. In fact, not only was the auditory style not a major learning style for either group, but also it was not found to be among the top three preferred learning styles for either group, ranking second lowest in the American group and third lowest in the P.R.C. group.

Question 5 asked:

> Do Chinese male students prefer some perceptual learning styles significantly more than Chinese females do?

The answer to this question is positive. This question was based on a conclusion by Reid, who found that males preferred some learning styles (visual and tactile) significantly more than females. In analyzing these data, both groups of P.R.C. males and females were combined. Statistical analysis showed that Chinese males favored individual learning significantly, $P<.05$, more than did Chinese females. In her study, Reid did not mention anything about females preferring some perceptual learning styles more than men do. However, this study found that the Chinese woman preferred the kinesthetic style significantly, $P<.05$, more than Chinese men do.

Question 6 asked:

> Do American male students prefer some perceptual learning styles significantly more than American females?

The answer to this question is yes. American male students in this study were found to prefer group learning significantly, $P<.05$, above American female students. This result was quite unexpected and may be more of an indication of the displeasure for group learning on the part of this group of American females than the strong preference for

group learning on the part of the American males. This opinion is supported by another result in this study which showed the Chinese females also to favor group learning significantly above the American females.

Question 7 asked:

> Are there any differences in preferred perceptual learning styles between American and Chinese male students?

The answer to this question is yes. Chinese males preferred individual learning significantly above American males. This result is consistent with an earlier test showing the Chinese males' strong preference for individual learning.

Question 8 asked:

> Are there any differences in preferred perceptual learning styles between American females and Chinese females?

The answer to this question is yes. Chinese females favored auditory and group learning styles significantly, $P<.05$, above American females. These results were consistent with prior results demonstrating: 1) The Chinese showing favor for the auditory learning style significantly above the Americans; and 2) The American females showing significantly less favor for group learning than other groups.

CONCLUSION

In evaluating the implications that can be drawn from the results of this study, several factors are presented for consideration. To begin with, the finding of no preferred major perceptual learning styles for any of the groups analyzed is a critical issue, especially when taking into consideration that the same instrument was used in another study that showed eight of the nine groups analyzed as having between two to four major learning styles identified. Several possible reasons for this occurrence have already been stated. Yet, regardless of the cause, these findings underline a notable problem: If the purpose of learning style analysis is to identify the approaches through which students learn most efficiently, how can the instructor be sure that actual preferences which the students possess have been accurately identified?

One response is to question the whole theory of the learning styles concept: Is it realistic to think that an instructor would be able to know one dimension of a student's learning approach that the student favors in every type of learning activity? A less drastic measure when one is doubtful that an identified style is actually the student's preferred style would be to question the validity and reliability of the instrument used. Possibly a second instrument would either confirm or negate previous findings.

For one skeptical of the idea of applying the learning style approach to an entire class, possibly some adjustments in how the theory is applied could be useful. For example, rather than applying the use of the learning styles approach to a class, possibly the instructor would find success in using the learning styles instrument with individuals in order to work with them on a one to one basis. This, in fact, is how the learning styles approach began -- with a focus on the individual learner. Possibly, it is not realistic to expect to identify group preferences for particular learning styles.

Another factor to be considered has to do with distinguishing between identified styles. How is one to determine if a style is preferred above another? Reid labeled styles as major, minor, and negative according to a set range in mean scores. However, the question is raised, "How much difference exists between the high and low scores of each range?" In this study, the Chinese students in the U.S. less than 18 months were identified as having a tactile major learning style with a score of 38.353 (Table V). These students were compared to Chinese students in the U.S. more than 18 months who were identified as having a tactile minor learning style with a score of 37.231. An analysis by T-Test of these two group mean scores revealed no significant difference. Can it be said that the major

learning style was any different than the minor learning style? If not, than where are the lines drawn?

A final factor to be considered deals with consistency of results. In Reid's study, the American students were identified as having the auditory style as their strongest preference. Reid also concluded that the longer students stayed in the U.S., the more auditory they became in their learning style preference. In contrast, the results in this study showed the American students rating the auditory learning style as their second least preferred style (Table IV). This study also showed that the P.R.C. students who were in the U.S. the longest were less auditory in their style preference than the students who were in the U.S. for a shorter period of time (Table VII and VIII). Also Wu (1982) concluded from his research that Chinese students are more inclined to process visual material due to the nature of the Chinese language. However, the observation of many who have done research in China is that the educational system in that country is based predominantly on lecture, which requires skill in auditory learning. This study did not find the P.R.C. students to favor visual learning as a preferred learning style and, although Reid did find the Chinese students to identify visual as one of their preferred styles, three other styles -- kinesthetic, tactile, and auditory -- were ranked above the visual style in order of preference.

Recommendations

In light of the results from this study, the following recommendations for implementing the learning styles approach and for doing further research are presented. Only one recommendation for incorporating the learning styles approach of teaching to the preferred perceptual learning style of the student in the English as a Second Language classroom can be made with any form of confidence on the part of this researcher. Substantial evidence seems to support the theory that individual students have particular means through which they learn best.

Therefore, it is recommended that instructors vary their teaching methods in order to avoid presenting information in a form where only a particular group of students benefits most. For example, instructors who find themselves predominantly lecturing may incorporate the use of an overhead projector for increased visual stimuli to assist students whose learning strength is visual. Also, the instructor might consider giving the option of constructing a model or performing an experiment for an assignment in order to assist those students whose learning strength is tactile.

Concerning further research, one recommendation would be to compare the instrument used in this study with other established learning style instruments such as The Learning

Style Inventory or The Edmonds Learning Style Identification Exercise.

Reid's instrument and one of the previously mentioned instruments could be given to few different groups of native and non-native students in order to discover if similar preferred perceptual learning styles are identified. Also, replications of other studies which used an established learning styles instrument can be done with Reid's instrument for the purpose of comparing results.

The reason for this recommendation is that this researcher believes further studies are needed in the area of accurately identifying perceptual learning styles of non-native students. It may be that the cultural factor involved makes it difficult to use standard learning style instruments with a variety of non-native student groups. In the case of this study, questions pertaining to role play were used to determine if students preferred the kinesthetic learning style. It is possible that there were students whose learning style preference was kinesthetic, but because they had not experienced much role playing in their learning environment, they were unable to express their preference due to the nature of the questions.

A second recommendation for further study is in the area of clearly distinguishing between major and minor perceptual learning styles. As it was demonstrated in this study, there occurred an instance where a group's low major

learning style score and a group's high minor learning style score showed no significant difference when tested by T-Tests.

A third and final recommendation for further study is in the area of identifying preferred perceptual learning styles for language groups. Is it realistic to assume that just because students share the same language they can be expected to have similar learning style preferences? The findings from this study suggest a great diversity of preferred styles exists within common language groups. Further studies are needed in this area to confirm the theory that particular language groups can be said to have particular learning styles preferences.

In conclusion, if the topic of learning styles for the native student can be described as an open field, then the topic of learning styles for the non-native student can be described as a barren field. Yet, despite many uncertainties surrounding the learning styles concept, there appears to be a kernel of truth amidst a lot of the chaff. This researcher believes that through the winnowing process of time and further research, the learning styles concept will one day show its true value to the educational field...but for the time being, one is advised to proceed with caution.

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APPENDIX A

PERCEPTUAL LEARNING STYLE PREFERENCE QUESTIONNAIRE

NAME_____ AGE_____ DATE_____

NATIVE COUNTRY_____ NATIVE LANGUAGE_____

GRADUATE STUDENT_____ UNDERGRADUATE_____ MALE_____ FEMALE_____

How long have you studied English in your country?_____

How long have you been in the U.S.? _____

DIRECTIONS:

People learn in many different ways. For example, some people learn primarily with their eyes (visual learners) or with their ears (auditory learners); some people prefer to learn by experience and/or by "hands-on" tasks (kinesthetic or tactile learners); some people learn better when they work alone while others prefer to learn in groups.

This questionnaire has been designed to help you identify the way(s) you learn best--the way(s) you prefer to learn.

Read each statement on the following pages. Please respond to the statements AS THEY APPLY TO YOUR STUDY OF ENGLISH.

Decide whether you agree or disagree with each statement. For example, if you strongly agree, mark:

strongly agree	agree	undecided	disagree	strongly disagree
X				

Please respond to each statement quickly, without too much thought. Try not to change your responses after you choose them. Please answer all the questions. Please use a pen to mark your choices.

PERCEPTUAL LEARNING STYLE PREFERENCE QUESTIONNAIRE

SA Strongly Agree	A Agree	U Undecided	D Disagree	SD Strongly Disagree

	SA	A	U	D	SD
1. When the teacher tells me the instructions I understand better.					
2. I prefer to learn by doing something in class.					
3. I get more work done when I work with others.					
4. I learn more when I study with a group.					
5. In class, I learn best when I work with others.					
6. I learn better by reading what the teacher writes on the chalkboard.					
7. When someone tells me how to do something in class, I learn it better.					
8. When I do things in class, I learn better.					
9. I remember things I have heard in class better than things I have read.					
10. When I read instructions, I remember them better.					
11. I learn more when I can make a model of something.					
12. I understand better when I read instructions.					
13. When I study alone, I remember things better.					
14. I learn more when I make something for a class project.					
15. I enjoy learning in class by doing experiments.					
16. I learn better when I make drawings as I study.					
17. I learn better in class when the teacher gives a lecture.					
18. When I work alone, I learn better.					
19. I understand things better in class when I participate in role-playing.					

	SA	A	U	D	SD
20. I learn better in class when I listen to someone.					
21. I enjoy working on an assignment with two or three classmates.					
22. When I build something, I remember what I have learned better.					
23. I prefer to study with others.					
24. I learn better by reading than by listening to someone.					
25. I enjoy making something for a class project.					
26. I learn best in class when I can participate in related activities.					
27. In class, I work better when I work alone.					
28. I prefer working on projects by myself.					
29. I learn more by reading textbooks than by listening to lectures.					
30. I prefer to work by myself.					

APPENDIX B

Instructions

There are 5 questions for each learning style category in this questionnaire. The questions are grouped below according to each learning style. Each question you answer has a numerical value:

SA	A	U	D	SD
5	4	3	2	1

Fill in the blanks below with the numerical value of each answer. For example, if you answered Strongly Agree (SA) for question 6 (a visual question), write a number 5 (SA) on the blank next to question 6 below.

*Visual

6 - 5

When you have completed all the numerical values for Visual, add the numbers. Multiply the answer by 2, and put the total in the appropriate blank.

Follow this process for each of the learning style categories. When you are finished, look at the scale at the bottom of the page; it will help you determine your major learning style preference(s), your minor learning style preference(s), and those learning style(s) that are negligible.

If you need help, please ask your teacher.

VISUAL

6 - ____
10 - ____
12 - ____
24 - ____
29 - ____

TOTAL____x 2 = ____(Score)

TACTILE

11 - ____
14 - ____
16 - ____
22 - ____
25 - ____

TOTAL____x 2 = ____(Score)

AUDITORY

1 - ____
7 - ____
9 - ____
17 - ____
20 - ____

TOTAL____x 2 = ____(Score)

GROUP

3 - ____
4 - ____
5 - ____
21 - ____
23 - ____

TOTAL____x 2 = ____(Score)

KINESTHETIC

2 - ____
8 - ____
15 - ____
19 - ____
26 - ____

TOTAL____x 2 = ____(Score)

INDIVIDUAL

13 - ____
18 - ____
27 - ____
28 - ____
30 - ____

TOTAL____x 2 = ____(Score)

Major Learning Style Preference	38-50
Minor Learning Style Preference	25-37
Negligible	0-24

APPENDIX C

Teachers of English to Speakers of Other Languages

AN INTERNATIONAL PROFESSIONAL ORGANIZATION FOR THOSE CONCERNED WITH THE TEACHING OF ENGLISH AS A SECOND OR FOREIGN LANGUAGE AND OF STANDARD ENGLISH AS A SECOND DIALECT

TESOL '88
Joy Reid
1344 Fairview Drive
Fort Collins, CO 80251
(303) 493-2838

1/11/87

Alex - Thanks for the call - here's the MSS, as promised. Not all data may agree EXACTLY with the TESOL article, but it's generally [redacted] Let me know how things

Joy

APPENDIX D

Dear Student,

I would appreciate very much your willingness to participate in this study. The purpose of this study is to help English as a Second Language teachers be more effective in teaching English to students from The People's Republic of China. By answering the following questions, you will help us to better understand ways in which students from China prefer to learn new information. This survey is not intended to evaluate your teacher in any way; it is intended to show the way you as a learner feel you learn best.

Following is an explanation of some terms which may need further explaining:

A) In questions 2 and 8, "doing something" and "do things" refers to being physically involved or actively participating in an activity. Going on a field trip or participation in role play would be an example of being physically involved in an activity.

B) In question 11, "a model" refers to actually making something with the information you receive. This could range from drawing a diagram or graph of some information in order to learn it to making something with materials to represent a concept or idea.

C) In question 19, "role play" refers to playing the part of a character in order to communicate an idea or learn a concept.

If you need to ask your teacher about any of the questions, feel free to do so. Also if you feel you would not like to take part in this study, you are under no obligation.

APPENDIX E

P.R.C. STUDENTS IN CHINA

Male							Female						
	V	A	K	T	G	I		V	A	K	T	G	I
1.	38	36	38	34	24	36		34	36	40	46	36	38
2.	34	38	32	42	38	34		32	38	38	34	30	32
3.	22	40	36	36	24	40		46	36	34	34	32	40
4.	34	36	38	32	30	38		32	40	44	38	34	38
5.	38	32	34	34	24	38		30	42	40	36	28	38
6.	24	40	44	38	26	44		36	32	42	50	30	34
7.	36	30	36	34	36	46		30	32	46	42	34	34
8.	44	28	34	36	26	48		38	38	40	38	36	38
9.	32	48	38	40	18	40		36	32	30	26	30	24
10.	38	32	28	32	18	40		38	32	32	34	34	40
11.	34	38	38	24	26	36		32	38	48	46	32	26
12.	34	40	32	22	24	42		32	28	38	42	24	40
13.	30	44	40	40	38	36		32	38	38	38	28	34
14.	40	38	32	32	30	36							
15.	40	38	40	36	34	32							
16.	42	36	36	36	34	36							
17.	30	36	36	44	32	24							

P.R.C. STUDENTS IN THE U.S.

Male							Female						
	V	A	K	T	G	I		V	A	K	T	G	I
1.	42	36	40	44	28	50		32	38	36	40	32	24
2.	34	36	44	44	40	28		32	36	34	36	34	32
3.	40	34	42	34	40	32		38	38	42	34	28	24
4.	36	42	40	38	34	32		36	40	32	38	28	38
5.	36	38	28	36	24	38		30	28	40	36	20	36
6.	34	36	32	40	28	32		36	40	38	38	28	42
7.	30	38	38	32	24	30		46	36	40	36	24	28
8.	42	36	30	32	20	32		48	34	42	46	42	28
9.	36	42	22	48	32	48		38	34	34	30	17	32
10.	44	36	38	42	20	50		34	34	30	34	24	34
11.	38	38	36	40	34	40							
12.	36	40	34	40	16	42							
13.	48	40	32	48	40	36							
14.	40	38	28	38	34	32							
15.	28	30	32	36	28	42							
16.	28	24	32	30	36	24							
17.	40	44	32	38	26	44							
18.	30	38	46	36	36	28							
19.	36	40	34	36	30	38							
20.	32	32	30	36	28	40							

under 18 mo.
over 18mo.

under 18 mo.
over 18 mo.

AMERICAN STUDENTS

Male		Female	
	V A K T G I		V A K T G I
1.	32,46,32,40,28,32,		46,20,36,34,32,30
2.	40,36,36,44,40,30,		32,40,46,38,30,38
3.	28,40,42,34,44,26		42,40,36,30,30,46
4.	36,38,44,36,28,34,		50,18,40,32,20,34
5.	38,38,38,36,22,42,		26,26,26,40,20,40
6.	40,24,38,36,28,40,		38,30,36,42,22,40
7.	28,32,32,32,30,36,		36,32,30,28,28,32
8.	30,32,34,30,30,28,		38,28,38,36,15,42
9.	20,34,44,34,28,20,		36,30,28,24,22,32
10.	42,30,28,42,38,36,		32,38,34,32,18,42
11.	46,32,34,48,26,42,		34,38,34,26,14,42
12.	32,48,42,42,44,20,		48,36,28,38,30,42
13.	38,34,30,20,32,38,		30,32,38,34,28,38
14.			32,32,46,44,34,26
15.			34,30,36,36,20,36
16.			32,40,36,28,30,38
17.			28,32,42,44,32,30